

1 Claims

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3 1. A turnover apparatus for turning over articles conveyed sideways on one
4 or more recirculating conveyor loops by frictional engagement therewith, comprising:

5 a series of spaced apart lugs attached along said conveyor loops and projecting
6 above an upper surface thereof to be able to be engaged by articles being advanced on said
7 conveyor loops;

8 a speed up belt located at a turnover station and positioned to frictionally engage
9 said articles carried thereto on said conveyor loops and advance the same into contact with a next
10 ahead lug attached to said conveyor chain at a point thereon ahead of said article;

11 a series of flipper arms, each pivotally mounted to said conveyor loops at a point
12 adjacent a respective lug, said flipper arms each configured to have a portion engage a leading
13 portion of a bottom side of an article driven against a bottom part of an associated lug;

14 a cam ramp located at said turnover station positioned to engage another portion
15 of each flipper arm successively causing said flipper arms to be successively pivoted up to
16 engage said portion with said article to raise said article to on an edge position, continued
17 operation of said speed up belts urging said article into abutment against said next ahead lug, said
18 lugs each having an overhung edge engaging an upper part of said article when driven
19 thereagainst, a lower part of said article driven past said edge to cause tipping over of said article
20 after said article is raised to an on edge position by said speed up belts.

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22 2. The apparatus according to claim 1 wherein said lugs each have a trailing

1 upper edge located to the rear of a said bottom part of said lug, operation of said speed up belt
2 driving said article to engage said trailing edge, a lower part of said article driven past said
3 trailing edge, tipping over said article backwards to complete said turnover.
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5 3. The apparatus according to claim 2 wherein said lugs each have a rear
6 facing curved shape creating said trailing edge to guide raising of said leading edge of said
7 article.
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9 4. The apparatus according to claim 1 wherein two spaced apart conveyor
10 loops are included to be able to support and sideways advance of elongated articles, each loop
11 having a series of said lugs and flipper arms mounted thereto, each aligned with a corresponding
12 lug and flipper arm on another conveyor chain loop.
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14 5. The apparatus according to claim 4 wherein two spaced apart speed up
15 belts are disposed between said two chain conveyor loops.
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17 6. The apparatus according to claim 1 wherein each of said flipper arms has a
18 first and a second segment, each segment extending at an angle to the other segment, a free end
19 of one downwardly extending segment pivotally mounted on a conveyor loop chain link pin
20 extending from an associated conveyor loop.
21

22 7. The apparatus according to claim 6 wherein each flipper arm second

1 segment extends upwardly to form a knee at the intersection of said first and second segments,
2 said knee engaging said cam to cause pivoting of each flipper arm when moving past said cam
3 ramp.

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5 8. The apparatus according to claim 7 further including an arcuate guide slot
6 formed in said second segment of each flipper arm and a guide pin extending from an associated
7 chain link of an associated chain link conveyor loop into said guide slot.

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9 9. The apparatus according to claim 1 wherein said cam ramp is adjustably
10 mounted to selectively enable varying of the angle of a cam surface engaging said another portion
11 of each flipper arm.

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13 10. The apparatus according to claim 1 further including a series of let down
14 elements pivotally mounted on said conveyor loop, each element located adjacent a respective
15 flipper arm, and a second cam ramp engaging each of said let down elements when advancing
16 through said turnover station for initial raise said let down element and thereafter lower the same,
17 each turnover element having a portion engaging a rear side of an article raised to an on edge
18 position.

19
20 11. A method of turning over articles at a turnover station along side a
21 conveyor including one or more conveyor loops supporting and frictionally engaging said articles
22 position on said conveyor loops to convey the same, including the steps of:

1 mounting a series of spaced apart lugs to each conveyor loop, said lugs each
2 having a portion projecting above said conveyor loops;
3 loading each article into aligned spaces between successive lugs;
4 pivotally mounting a flipper arm to said one or more conveyor loops adjacent each
5 lug, each flipper arm having a portion normally positioned just below a rear side of each lug;
6 driving each article so as to be advanced on said one or more conveyor loops into
7 abutment with a next ahead lug;
8 locating a cam ramp adjacent each conveyor loop at said turnover station to
9 engage a portion of each flipper arm on said flipper arms in said turnover station, said cam ramp
10 configured to cause an upward movement of said flipper arm to engage a portion thereof with a
11 leading side of an article abutting a lug to elevate said leading side thereof.

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13 12. The method according to claim 11 further including the steps of providing
14 a trailing upper edge on each lug spaced above an article in abutment against said lug;
15 raising said article to an on edge position with said flipper arm motion; and
16 thereafter advancing said on edge article against said lug trailing edge by a
17 frictional engagement of a speed up drive belt with a lower edge of said article to thereafter tip
18 over said article in a rearward direction to complete the turnover a said turnover station.

19
20 13. The method according to claim 12 wherein two or more spaced conveyor
21 loops are used to convey said articles each conveyor lug having aligned series of lugs mounted
22 thereto, and a pair of drive belts are interposed between said conveyor loops to drive a conveyed

1 article into abutment therewith.

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3 14. The method according to claim 12 further including the step of engaging
4 an upper rear portion of each article as it is tipping over, and controllably restraining lowering
5 thereof to slow the rate of dropping motion thereof.
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7 15. The method according to claim 14 wherein a let down element is pivotally
8 mounted to said conveyor loop, each let down element pivotally mounted located adjacent a
9 respective flipper arm and is driven to engage said upper rear portion of said article with a second
10 cam ramp to control descent thereof as said article tips over.
11

12 16. Apparatus for flipping over articles on a chain loop conveyor having an
13 upper surface frictionally engaging said articles resisting thereon to convey said articles by
14 advance of said chain loop, comprising a series of spaced apart lugs mounted to said chain loop
15 defining intervening spaces able to receive an article to be turned over;

16 a series of flipper elements pivotally mounted to said chain loop, each flipper
17 element located adjacent an associated lug and pivotable to raise a first portion thereof into
18 engagement with a leading side of an article abutting an associated lug;

19 a cam surface mounted at a turnover station to engage each flipper element moved
20 past said turnover station and engaging the same to cause said pivoting raising motion thereof,
21 said raising motion flipping said article up on said conveyor chain.
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1 17. An apparatus according to claim 16 further including a speed up drive
2 engaging each article to advance the same against the next ahead lug prior to entering said
3 turnover station.
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5 18. An apparatus according to claim 17 wherein each lug has a trailing
6 overhung edge to engage an upper portion of said article flipped up by said flipper element, and
7 said speed up drive further driving the bottom of said article while having an upper portion in
8 engagement with said overhung edge to cause tipping over of said article.
9

10 19. An apparatus according to claim 18 further including a let down element
11 pivotally mounted on one said of said conveyor chain adjacent each flipper element, a second
12 cam having an entrance segment engaging and pivoting up said let down element in said turnover
13 station to engage on upper portion of said article tipped over by said engagement with said
14 trailing edge, said second cam surface having an exit segment engaging said let down element to
15 allow a controlled descent thereof as said article tips over to insure a slowed rate of drop to avoid
16 damage thereto.
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